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IMAGERY INTERPRETATION RESEARCH PROGRAM

PRELIMINARY REPORT

HUMAN FACTORS EVALUATION

1540 LIGHT TABLE

MAY 1969

AUTHOR

[redacted]

STAT

Declass Review by NGA.

DK-425

STAT [redacted]

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1.0 INTRODUCTION

On 7 May 1969 the Contractor performed a human factors evaluation of the [redacted] MIM-6, Split-Format 1540 Light Table at the Sponsor's facility.

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2.0 OBJECTIVE

The objective of the human factors evaluation was to determine if the subject light table prototype model meets the human factor requirements imposed by the design objective and general human engineering requirements as given in the Human Engineering Design Guide for Image Interpretation Equipment, [redacted] February 1969.

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3.0 APPROACH

A human factors checklist was compiled from applicable sections of the Design Guide with particular attention given to anthropometric considerations. The evaluation consisted of evaluating light table features against the human factors checklist. The evaluation was made of a prototype model 1540 table with [redacted] Zoom 240 Microstereoscope fitted with mono-stereo tilting eyepieces and advanced stereo rhomboid (optical axis separation of 1.6 to 9.5 inches).

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Several light table parameters, illumination level, color and uniformity of illumination, flicker, noise, and vibration require sophisticated electronic instrumentation for checkout. These tasks are to be accomplished by Sponsor Test and Evaluation Group. The present evaluation included those parameters listed below.

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4.0 RESULTS

The following paragraphs present a summary of the results of the checklist evaluation along with recommendations for change on items found at variance with good human engineering practice.

4.1 General Configuration

- o Eyepiece Height. Adequate eyepiece height adjustments are possible which accommodate a 5th percentile female and a 95th percentile male. The light table will accommodate operators falling within this range.
- o Kneewell Dimensions. The kneewell depth measures 14.5 inches which is .5 inches less than required for a typical control console. However, the 14.5 inches appears adequate in this particular case.

4.2 Film Loading and Unloading

Loading and unloading of roll film is possible at all elevations of the light table. Access is adequate and spool width adjustment is in discrete steps. Two-handed manipulation of the film spool during loading is not possible.

4.3 Motorized Film Transport

Film tension is automatic and remains adequate at all film movement speeds. Direction-rate controls are accessible from normal operator viewing position. Emergency film crank handles are provided but are inadequate for normal operational use because of their small size.

4.4 Motorized Microstereoscope Carriage

Microscope height adjustment range is adequate. However, no provision is made to prevent the microscope rhomboid from striking the film or table formats when lowered. Damage to the rhomboid, film or table surface could result.

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No locking mechanism is provided for the microscope carriage when power is off. The microscope with rhomboid attachment could be damaged should the unit be slammed against the carriage travel stops as a result of negligence or transportation of the table.

4.5 Motorized Table Height Elevation

Motorized height adjustment is slow and unstable. The table oscillates noticeably when being raised and lowered. The spring loaded toggle switch control is appropriate for its function but must be operated from a standing position at higher table elevations. No change in position of the control switch is recommended. It is recommended that the elevating system be improved such that table oscillation is eliminated.

4.6 Labels and Secondary Displays

Labels "Front," "Rear," and "Lower" for toggle switches controling direction of spool rotation appear below their respective switches. They should be positioned above their respective switches.

"On" and "Off" labels for the film motor power switch are placed to the left and right of the switch. The switch should be rotated clockwise 45 degrees so that the "On" position is up and the "Off" position is down, and labeled appropriately above and below the switch.

The stick-on label which reads "Do Not Reverse with Power ON" and appears directly above the motor direction controls should be engraved on a panel with a red border and read, "CAUTION, . . .".

Red indicator lights which accompany the main power switch and film drive power switch should be white. A white indicator light should also be provided for the microscope carriage power switch.

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4.7 Controls

The film speed control is adequate for moving film at both fast and slow speeds. A "Null" position can be found which keeps the film from moving. The "Null" position varies as a function of the relative amount of film on each spool.

The crank which controls slow film movement is difficult to control. Because a threshold rotation rate must be attained prior to film movement, adequate control is difficult. If a more stable control cannot be provided for this function, a training program will be required. The program will train the operator in the use of the motorized film transport system.

Film speed and light intensity control knobs are the same in size and shape. They should be shape coded to prevent confusion between the two knobs.

The joystick which controls the motorized carriage X, Y, and X-Y movement is located too close to the carriage lock release button. It should be relocated so that adequate access is possible, possibly on the opposite side of the microscope mount.

5.0 SUBMITTAL OF FORMAL REPORT

This document is supplied as a "quick look" report. A report presenting additional details on the method and including a copy of the checklist used for the evaluation will be submitted as a final report on this item.

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